

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-20 are presently active in this case. The present Amendment amends Claims 1-3, 5, 6, 10, and 15, and adds Claims 16-20.

In the outstanding Office Action, Claims 1-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Atwood et al. (U.S. Patent No. 2,985,409) in view of Chakravarty et al. (U.S. Patent No. 5,072,893).

In response to the rejection of Claims 1-15 under 35 U.S.C. § 103(a), the claims are amended and Applicant respectfully requests reconsideration of the rejection and traverses the rejection as discussed next.

Applicant's invention, as recited in amended Claim 1, relates to an inertial reference system for an aircraft including a first accelerometer located at a front vibration antinode of the aircraft, a second accelerometer located at a rear vibration antinode of the aircraft, a gyrometer located at a center vibration node of the aircraft, and a control computer linked to the first and second accelerometers and to the gyrometer.

Applicant's invention, as recited in amended Claim 6, relates to a system for controlling an aircraft including means for receiving first vertical acceleration data related to a vertical acceleration of a front vibration antinode of the aircraft, means for receiving second vertical acceleration data related to a vertical acceleration of a rear vibration antinode of said aircraft;  
means for receiving pitch rate data related to a pitch rate of a center vibration node of said aircraft, and means for generating a pitch command based on the first and second vertical acceleration data and on the pitch rate data.

Claims 1 and 6 have been amended to recite a front/rear "vibration antinode" instead of front/rear "portion," and to recite a center "vibration node" instead of a center "portion." These features find non-limiting support in the disclosure as originally filed.<sup>1</sup> Claims 2 and 3 have been amended accordingly.

Turning now to the applied prior art, the Atwood et al. patent relates to a pair of accelerometers measuring acceleration along an axis normal to the line joining the accelerometers to ultimately control the pitch of the aircraft. Applicant respectfully submits that the Atwood et al. patent does not teach locating any element at a "vibration antinode" or at a "vibration node."<sup>2</sup> In the Atwood et al. patent, the accelerators are located both in front of and behind the center of gravity of the aircraft, as illustrated in Fig. 1 of the Atwood et al. patent, but locating them at vibration antinodes is not taught. Further, the location of the gyrometer in the Atwood et al. patent is neither taught to be at a vibration node nor even near the center of gravity (see Fig. 1).

The Chakravarty et al. patent is directed to an active aircraft modal suppression control system which is capable of accurately sensing modal induced oscillations and producing control signals to deploy control surfaces to suppress such accelerations. However, the Chakravarty et al. patent does not teach locating anything at a vibration node or antinode.

Therefore, the Atwood et al. and Chakravarty et al. patents, whether taken alone or in combination, fail to teach or suggest every feature recited in Applicant's amended Claims 1 and 6, so that Claims 1-9 are patentably distinct over the Atwood et al. and Chakravarty et al. patents.

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<sup>1</sup> See page 3, lines 8-10, of Applicant's specification.

<sup>2</sup> See MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

Applicant's invention, as recited in Claim 10, relates to a system for controlling an aircraft including means for receiving first horizontal acceleration data related to a horizontal acceleration of a front portion of the aircraft, means for receiving second horizontal acceleration data related to a horizontal acceleration of a rear portion of the aircraft, means for receiving roll rate data related to a roll rate of a center portion of the aircraft, means for receiving yaw rate data related to a yaw rate of a center portion of the aircraft, and means for generating both a roll command and a yaw command based on the first and second horizontal acceleration data, on the roll rate data, and on the yaw rate data.

Claim 10 has been amended to recite generating both a roll command and a yaw command rather than at least one of a roll command and a yaw command.

As discussed above, the Atwood et al. patent relates to a pair of accelerometers measuring acceleration along an axis normal to the line joining the accelerometers to ultimately control the pitch of the aircraft. Accordingly, the Atwood et al. patent is concerned with controlling pitch and does not teach generating either a roll or a yaw command.

The Chakravarty et al. patent is limited to lateral accelerations: "The present invention is an active system for suppressing accelerations due to lateral mode excitation."<sup>3</sup> Accordingly, only yaw is controlled by this system, a difference emphasized by the amendment to Claim 10. The Chakravarty et al. patent only teaches generating a yaw command (called the "yaw damper").<sup>4</sup> This limitation is illustrated even more clearly in Figs. 5 and 6 of the Chakravarty et al. patent which show the inputs of the system along with its single output at the "rudder power control unit" 214. The rudder 26 implements the yaw command (col. 3, lines 7-16). There are variations of the system, with varying numbers of accelerometers, but always a single output dedicated to the control of yaw. Accordingly, the

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<sup>3</sup> See Col. 2, lines 58-59, in the Chakravarty et al. patent.

<sup>4</sup> See the equation at col. 5, line 20, of the Chakravarty et al. patent.

Chakravarty et al. patent does not teach “means for generating **both** a roll command and a yaw command based on said first and second horizontal data, on said roll rate data, and on said yaw rate data.”

Therefore, the Atwood et al. and Chakravarty et al. patents, whether taken alone or in combination, fail to teach or suggest every feature recited in Applicant's Claim 10, so that Claims 10-15 are patentably distinct over the Atwood et al. and Chakravarty et al. patents.

Applicant respectfully submits that any modernization of the control system of the Atwood et al. patent into a computer in view of the Chakravarty et al. patent could not teach the above-mentioned elements of Claims 1, 6, and 10 not taught by the Atwood et al. and Chakravarty et al. patents since these elements have nothing to do with computation. Furthermore, Applicant respectfully submits that any modernization of the control system of the Atwood et al. patent into a computer in view of the Chakravarty et al. patent would not be obvious at all to one having ordinary skill in the art, since the computer in the Chakravarty et al. is limited to a specific processing of yaw, as discussed above, and, therefore, could not be combined or adapted to the pitch control system of the Atwood et al. patent to obtain the claimed invention. Further, even if the teachings of the applied references could be combined, a change in the principle of operation would be necessary and then the teachings of the references would not be sufficient to render the claims *prima facie* obvious.<sup>5</sup>

Accordingly, Applicant respectfully traverses and requests reconsideration of the rejection of Claims 1-15 under 35 U.S.C. § 103(a) based on the Atwood et al. and Chakravarty et al. patents.

In order to vary the scope of protection recited in the claims, new Claims 16-20 are added. Claim 16 is similar to Claims 10 and 15, but written independently in a slightly

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<sup>5</sup> See MPEP 2143.01: "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious."

different manner, and having an additional feature discussed in the disclosure at least at page 8, lines 23-25, and page 10, lines 6-8 and 13-15. Claim 17 pertains to a processing of the roll, pitch, and yaw rate data, the vertical acceleration data, and the horizontal acceleration data of Claim 16. This processing is discussed at least at page 8, lines 5-16, and page 9, lines 7-17, of the disclosure. Claims 18 and 19 pertain to roll angle information discussed at least at page 9, lines 18-22, of the disclosure. Claim 20 pertains to the control surfaces discussed at least at page 7, lines 20-24, of the disclosure. Thus, new Claims 16-20 find non-limiting support in the disclosure as originally filed. Therefore, the new claims are not believed to raise a question of new matter.<sup>6</sup>

Applicant respectfully requests, should a rejection be maintained, or new rejections put forth, that passages in the cited prior art be identified in connection with each allegation that an element of a claim is taught by prior art. This would be most helpful to and appreciated by Applicant when addressing such a rejection.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-20 is earnestly solicited.

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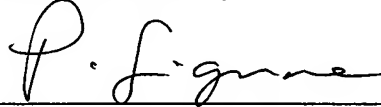
<sup>6</sup> See MPEP 2163.06 stating that "information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter."

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Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number.

Respectfully submitted,

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